

NOTE

Hylaeus punctatus (Brullé) (Colletidae), a Palaearctic Bee Long Established in South America

ARTURO ROIG-ALSINA

Museo Argentino de Ciencias Naturales "Bernardino Rivadavia" Av. Angel Gallardo 470,
1405 Buenos Aires, Argentina; email: arturo@macn.gov.ar

The bee *Hylaeus punctatus* (Brullé) is recorded for the first time for Argentina, where it was introduced over thirty years ago, according to museum records. The introduction of *H. punctatus* into the New World has already been reported for the United States and Chile. Snelling (1983a) first recorded the species from southern California in 1981, and later Toro et al. (1989) reported its first sighting in the central region of Chile in 1986. The study of museum specimens reveals that *H. punctatus* was present in southern South America before these dates. Two specimens kept in the collection of the Museo Argentino de Ciencias Naturales in Buenos Aires were collected by the entomologist Adriana Oliva in the city of Buenos Aires in May 1976. Today the species is a common and abundant member of the bee fauna of the city of Buenos Aires and surrounding areas. This bee is further recorded here for two other, distant, localities in Argentina: the central west province of Mendoza and the Patagonian province of Río Negro.

This small colletid bee is native to the Mediterranean area of the Palaearctic Region (Dathe 1980, Snelling 1983a). It belongs to the subgenus *Spatulariella* Popov, all the species of which have a Palaearctic distribution (Michener 2000), with the only exception being *H. punctatus*, adventive in the New World. This species is easy to distinguish from the many native South American species of *Hylaeus* by the eighth metasomal sternum of the male. This

sternum ends in a spoon-shaped expansion, which protrudes from the apex of the abdomen.

At least six exotic species of bees have become established in Argentina. Of these, only *Hylaeus punctatus* is deemed to have been introduced accidentally into this country. Other species have been purposefully introduced, or have been introduced into neighboring countries and later dispersed to Argentina. Two species, *Apis mellifera* L. and *Megachile rotundata* (Fabricius), were introduced for economic purposes at various times. A fourth species, the Palaearctic *Bombus ruderatus* Fabricius, was introduced into Chile for pollination, and later expanded its range into southern Argentina (Roig Alsina and Aizen 1996). A fifth species, *Lithurgus huberi* Ducke, is widespread in Brazil, where it occurs from the northern state of Para to Minas Gerais and São Paulo (Silveira et al. 2002). It occurs in Argentina in the province of Misiones (San Ignacio, Museo Argentino de Ciencias Naturales, new record). According to Snelling (1983b) this species belongs to the Indo-Australian group of *Lithurgus atratus* (Smith); moreover, he found no morphological differences by which *L. atratus* may be separated from *L. huberi*, considering that this species is adventive in Brazil, probably introduced by man in historical times. Another exotic species present in Argentina is the Old World *Anthidium manicatum* (L.). This species has been recorded for the province

of Buenos Aires by Michener (2000). *Anthidium manicatum* also occurs in the eastern and southern states of Brazil, where it would have been introduced from Europe (Silveira et al. 2002); according to these authors the species, although broadly distributed in Brazil, seems to be rare. Finally, a likely candidate to become established in Argentina in the near future is *Bombus terrestris* (L.), which was introduced into Chile for pollination in 1997 (Estay and Vitta 2004). This bee is expected to follow the same route across the low southern Andes into western Patagonia as did *Bombus ruderatus* in the early 1990's.

Hylaeus punctatus has been collected in the Buenos Aires area in urban and suburban, as well as in natural habitats. In the city of Buenos Aires it is common in parks, and has been collected visiting flowers on balconies of buildings up to the seventh floor. Both males and females are common. The bee has been found in urban habitats in the provinces of Mendoza and Río Negro, in house gardens in the city of Mendoza, and in house gardens of the town El Bolsón in the latter province. Many records of flower visitation correspond to introduced exotic plants, such as *Eryobotria japonica* (Thunb.) Lindl., *Lavandula officinalis* Chaix, *Mentha aquatica* L., and *Alyssum* sp. Specimens have also been collected on *Asclepias curassavica* L., *Eryngium* sp., and *Baccharis pingraea* DC., all of which are native plants. Toro et al. (1989) recorded that the bee flies late in the season in Chile, but collecting dates in the area of Buenos Aires indicate that the bee is active from spring (October) to late summer (May).

The following is a list of the collection records for *H. punctatus* in Argentina. Specimens studied and cited below are housed at the collection of the Museo Argentino de Ciencias Naturales "Bernardino Rivadavia" in Buenos Aires, Argentina.

Buenos Aires City: Palermo, V-22-1976, in house garden on flowers of *Eryobotria japonica* (A. Oliva); Villa Crespo, IV-14-1985, in balcony on 7th floor (A. Roig A.); Botanical Garden,

Facultad de Agronomía, XII-29-1994 (A. Roig A.); Parque Centenario, X-31-1995, in balcony on 7th floor on flowers of *Alyssum* sp. (A. Roig A.); Colegiales, I-18-1996, in house garden on flowers of *Asclepias curassavica* (A. Oliva); Colegiales, II-12-1996, in house garden on flowers of *Mentha* sp. (A. Oliva); Palermo, II-6-2003, in park on flowers of *Lavandula officinalis* (A. Roig A.). *Province of Buenos Aires:* Partido de Vicente López, La Lucila, II-17-1985 (L. Moffatt); Partido de Tigre, 12 km NW Tigre, I-20-1990, on flowers of *Eryngium* sp. (A. Roig A.); Partido de Escobar, Maquinista Savio, I-5-1997, on flowers of *Baccharis pingraea* (A. Roig A.); Partido de Vicente López, La Lucila, I-1-2003 (A. Roig A.); Partido de Hurlingham, Estación Experimental Inta Castelar, XI-6-2003, on flowers of *Lithrea molleoides* (Vell.) Engl. (L. Compagnucci & A. Roig A.). *Province of Mendoza:* Mendoza city, II-15-1994, in house garden on flowers of *Mentha aquatica* (A. Roig A.). *Province of Río Negro:* El Bolsón, II-3-1994, in house garden (A. Roig A.).

Species of *Hylaeus* nest in pre-existing holes and crevices, mainly in wood and twigs, but in other materials as well. This nesting behavior has surely facilitated the transport by man of these bees for long distances, carried along with their nesting substrates. The type of nesting behavior among bees is tightly correlated with their chance of becoming introduced species. There are two main types of nests (Malyshv 1935, Stephen et al. 1969, Michener 2000): those of burrowing bees, which have an excavated tunnel (usually in the soil) leading to the cells, and those of non-burrowing bees, which are constructed in the open or taking advantage of pre-formed cavities. Although there are certain species of bees with intermediate behaviors (Stephen et al. 1969), and there are certain lineages in which both types of behavior are present, this classification holds for entire lineages of bees. Most species of bees that have been introduced accidentally into exotic areas are non-burrowers. For example, of fourteen species reported that have accidentally become established in the United States (Daly 1966, Eickwort 1980, Snelling 1983a, Mangum and Brooks 1997), thirteen of them are non-burrowing bees.

These bees belong in the genera *Anthidium* Fabricius, *Chelostoma* Latreille, *Hoplitis* Klug, *Lithurgus* Berthold, and *Megachile* Latreille of the family Megachilidae, *Ceratina* Latreille of the family Apidae, and *Hylaeus* Fabricius of the family Colletidae. As another example, the only two exotic species that occur in Brazil (Silveira et al. 2002) which have been accidentally introduced, belong to the genera *Anthidium* and *Lithurgus*. All these groups nest in pre-existing holes or crevices.

Available records and distribution suggest that *H. punctatus* is mainly associated today with human-modified habitats in Argentina. The dispersal of this species within the country (city of Mendoza, and El Bolsón town) may have been mediated by human transport, in a similar way in which the species first came to the country. There are no existing records in intermediate places between Buenos Aires and these two distant localities, although surveys have been conducted. In the province of Buenos Aires it has penetrated agricultural (Hurlingham, Escobar) and natural habitats (Tigre), where it has been recorded visiting native plants. On this ground, the progressive expansion of the bee to other areas in Argentina can be predicted.

The possible geographic origin of the invasive population in California was discussed by Snelling (1983a). He argues that this population matches more closely the color variant found in southern Europe, than the darker forms found in central Europe or the more extensively pale marked specimens of the subspecies *H. punctatus longimaculus* Alfken. In this respect the populations from Argentina agree with the pattern described by Snelling. Since introduction in Argentina antedates introduction in the U.S.A., the California population may have originated either from Europe or from Argentina. The same may be argued for the Chilean population. At least a dispersal from Argentina to Chile seems feasible, taking into account the invasion of other hyme-

nopterans that have dispersed from Argentina to Chile, for example the paper-wasp *Polistes buyssoni* Brèthes (Pérez D'Angello 1970). Of course, the dispersal of *Hylaeus punctatus* to the New World may have occurred independently several times from the Old World. The various possibilities of dispersal are difficult to assess without appropriate methods, such as a phylogeographic molecular analysis, beyond the scope of this contribution.

LITERATURE CITED

- Daly, H. V. 1966. Biological studies on *Ceratina dallatorreana*, an alien bee in California which reproduces by parthenogenesis. *Annals of the Entomological Society of America* 59: 1138–1154.
- Dathe, H. H. 1980. Die Arten de Gattung *Hylaeus* F. in Europa. *Mitteilungen aus dem Zoologischen Museum in Berlin* 56: 207–294.
- Eickwort, G. C. 1980. Two European species of *Chelostoma* established in New York State, USA (Hymenoptera: Megachilidae). *Psyche* 87: 315–323.
- Estay, P. and N. Vitta. 2004. Evaluación de *Bombus terrestris* reproducidos en Chile como polinizador de flores de Palto, *Persea americana*. XXVI Congreso Nacional de Entomología, Sociedad Entomológica de Chile. Universidad de Concepción, Concepción, Chile.
- Malyshev, S. I. 1935. The nesting habits of solitary bees. A comparative study. *Eos* 11: 201–309.
- Mangum, W. A. and R. W. Brooks. 1997. First records of *Megachile* (*Callomegachile*) *sculpturalis* Smith (Hymenoptera, Megachilidae) in the Continental United States. *Journal of the Kansas Entomological Society* 70: 140–142.
- Michener, C. D. 2000. *The Bees of the World*. The John Hopkins University Press, Baltimore and London.
- Pérez D'Angello, V. 1970. El género *Polistes* Latreille 1802, en Chile. *Museo Nacional de Historia Natural, Santiago, Noticiario Mensual* 169: 10.
- Roig Alsina, A. and M. A. Aizen. 1996. *Bombus ruderatus* Fabricius, una nueva especie de *Bombus* para la Argentina (Hymenoptera: Apidae). *Physis, Buenos Aires, Sec. C* 51: 49–50.
- Silveira, F., G. A. R. Melo, and E. A. B. Almeida. 2002. *Abelhas brasileiras. Sistemática e identificação*. Belo Horizonte.
- Snelling, R. R. 1983a. Studies on North American bees of the genus *Hylaeus*, 6. On adventive Palaearctic species in southern California. *Bulletin of the Southern California Academy of Sciences* 82: 12–16.
- Snelling, R. R. 1983b. The North American species of the bee genus *Lithurge* (Hymenoptera: Megachilidae). *Contributions in Science, Natural History Museum of Los Angeles County* 343: 1–11.

Stephen, W. P., G. E. Bohart, and P. E. Torchio. 1969. *The biology and external morphology of bees with a synopsis of the genera of Northwestern America*. Agricultural Experiment Station, Oregon State University, Corvallis.

Toro, H., Y. Frederick, and A. Henry. 1989. Hylaeinae (Hymenoptera, Colletidae), nueva subfamilia para la fauna Chilena. *Acta Entomologica Chilena* 15: 201-204.